ADC Block Search

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When you have a Connection Agreement on ADC that specifies an Exchange and a Windows server, we keep track of what we already replicated based on the USN-Changed attribute.

When it is time for a new cycle, ADC will search the Exchange directory for all objects that have a USN-Changed attribute greater than the “highestCommittedUSN” that we had the last time we start a cycle.

Let’s make an example where you have a One-way Connection Agreement from Exchange to Active Directory:

1) We read the “highestCommittedUSN” from the Exchange Server, let’s suppose it is 1500.
2) We search for all entries on the Exchange Directory that has USN-Changed greater than 0 (zero), because it is the first time this Connection Agreement is running.
3) We do all the additions, modifications and deletions.
4) When we’re done, we commit the 1500 to the attribute msExchServer1HighestUSN on the Connection Agreement.
5) On the next cycle, we’ll search for all entries that have USN-Changed greater than 1500, which is the last highestCommittedUSN that we saw.

This is the same process for the opposite direction, AD to Exchange.

Here is some situation that could happen: Imagine that you have 100,000 entries on your Exchange Server. ADC starts replicating and when you’re on 99,999 the power goes down. When you start again, ADC will read the msExchServer1HighestUSN and it will be zero, because we couldn’t get to the step 4 above.

To avoid this situation ADC do a Block Search, what means we search by ranges of USN-Changed. Here is the real algorithm:

1) We read the “highestCommittedUSN” from Exchange, let’s suppose it is 500,000.
2) Read the msExchServer1HighestUSN (zero if first time), let’s call this X.
3) Search all entries that have USN-Changed is greater than X and less than (X+10,000).
4) Do all additions, modifications, deletions for this entries
5) Commit the msExchServer1HighestUSN on the Connection Agreement with X+10,000. (*)

6) While X is less than 500,000, X = X + 10,000, and go back to 3.
7) Commit the msExchServer1HighestUSN with 500,000.

(*Read the KB ‘When ADC Commit Changes to AD’)

Now, we have a much better solution for a power outage or any other problem that might interrupt the ADC replication. On the worst-case scenario, you’ll have to replicate only 10,000 entries. In real world actually it is much less than that, because there is no direct formula between USN-Changed and the number of entries. For a company that perform several modifications per week on its users, like telephone number changes, or other attribute changes, it will reduce even more the number of entries in a 10,000 USN block.

If you have a small Directory with less than 5,000 Mailboxes, Custom Recipients and Distribution Lists, ADC would be fast enough to replicate all those entries in a single block and in a very short period of time.